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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: PROCEDURE AND SYSTEM FOR PROVIDING A SERVICE								
(57) Abstract								
<p>System and procedure for implementing a service in a telecommunication system comprising a first terminal device (1), a control centre (2) comprising means for handling short messages and/or data calls, an automatic apparatus (3) comprising a second terminal device (4) and a control unit (5) connected to it, a telecommunication network (6) comprising an intelligent network (7), said intelligent network containing means (8) for determining charge and location data and producing voice messages, a first telecommunication connection (9) and a second telecommunication connection (10). In the system, the first terminal device (1) and the second terminal device (4) as well as the control centre (2) are connected to the telecommunication network (6). In the procedure, a product is ordered by making a call from the first terminal device (1) to a number shown on the automatic apparatus (3). The control unit (5) controls the automatic apparatus (3) and the second terminal device (4) disposed in the automatic apparatus (3) in such a way that the customer will get the product ordered. If the automatic apparatus has run out of the product or is having a malfunction, then the customer is informed about it by sending a voice message.</p>								

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## PROCEDURE AND SYSTEM FOR PROVIDING A SERVICE

The present invention relates to a procedure as defined in the preamble of claim 1 and a system as defined in the preamble of claim 9 for providing a product or service in a telecommunication system. In the procedure and system of the invention, a terminal device in a telecommunication network is used as a means of payment for various purchases made through automatic delivery apparatus. A calling subscriber communicates by means of a first terminal device in the telecommunication network with a second terminal device in the telecommunication network via at least one, preferably specially priced service number included in an intelligent network, the subscription to be charged for use of the service being the calling subscription.

In prior art, various specially priced service numbers provided in a telecommunication network which are common to all callers, such as e.g. numbers beginning with 0600 or 0700, are known. However, such service numbers, so-called B-numbers, are not actual subscriber numbers but the switch and exchange system of the telecommunication network connects the calling subscriber's calls to the actual subscriber numbers, so-called C-numbers behind the service numbers. This type of solutions are typically implemented by utilising an intelligent network.

Previously known are also solutions in which mobile stations are used in various payment systems in electric payment applications. However, no prior-art solution is known in which a customer could use a mobile station as a means of payment to pay for different commodities, such as beverages, sweets, tobacco, tickets and equivalent, bought through a vending machine. So far, the user of a mobile station has not been able to control the operation of an

automatic service apparatus by means of his/her mobile station.

In the methods mentioned above, the problem is that the user of the automatic apparatus does not necessarily have any cash or coins of suitable value, so in this case it would be practical to pay for vendor purchases e.g. by means of a mobile telephone. Furthermore, in prior-art automated services it has not been possible to define the user group for which the automatic apparatus is intended, but instead anyone has been allowed to use it.

The object of the present invention is to eliminate the drawbacks described above.

A specific object of the present invention is to disclose a new type of procedure and system in which a customer's terminal device, preferably a mobile station connected to a telecommunication network functions as a means of payment for various purchases made through a vending machine. A further object of the invention is create a procedure and system in which optional, predetermined actions related to an automated service are carried out by means of a mobile station and a control unit of the automatic apparatus and of the mobile station, placed in the automatic apparatus, in accordance with instructions given by the customer via his/her mobile station.

As for the features characteristic of the invention, reference is made to the claims.

In the system and procedure of the invention for providing a service, the system of the invention comprises a first terminal device, a control centre, an automatic apparatus comprising a second terminal device and a control unit connected to it, a telecommunication network comprising an intelligent network, a first telecommunication connection and a second telecommunication connection. Moreover, in the

system, the control centre comprises means for handling short messages and/or data calls.

In the system of the invention, the first and the second terminal devices as well as the control 5 centre are connected to the telecommunication network. Disposed in the telecommunication network are means for determining the location of the calling subscriber. Moreover, the intelligent network is provided with means for directing a call to the 10 automatic apparatus nearest to the terminal device. In addition, means comprised in the intelligent network can be used to give the calling subscriber a voice message about the condition of the automatic apparatus and determine charge data regarding the call.

15 The control unit comprised in the system of the invention is provided with means for controlling and monitoring the functions of the automatic apparatus and for monitoring the second telecommunication connection. Moreover, the control 20 unit comprises means for setting the terminal device contained in the automatic apparatus to a "busy" or "no answer" state and, when necessary, shutting off the terminal device. The control unit is e.g. a computer or microcontroller.

25 In the procedure of the invention, the calling subscriber orders a product from an automatic service apparatus by means of a first terminal device by setting up a first telecommunication connection with the called subscriber number, whereupon the first 30 telecommunication connection is directed to an intelligent network. In the intelligent network, call charge data is determined, a second telecommunication connection with a second terminal device is set up and the automatic apparatus is controlled by means of a 35 control unit on the basis of the second telecommunication connection and the state of the automatic apparatus, as follows:

- If the automatic apparatus has run out of the product ordered and/or the service is busy, then the control unit sets the second terminal device into a "busy" or "no answer" state and the user of the first 5 terminal device is informed about the state of the automatic apparatus by means of a voice message sent over the first telecommunication connection.

- If the automatic apparatus has run out of all products and/or services, then the control unit shuts 10 off the second terminal device, and the user of the first terminal device is informed about the state of the automatic apparatus as above.

- If there is a malfunction in the automatic service apparatus, then the control unit sets the 15 second terminal device into a "busy" or "no answer" state, and the user of the first terminal device is informed about the state of the automatic apparatus as above.

Furthermore, in the procedure and system of 20 the invention, the location of the calling subscriber can be determined on the basis of the location data of the first terminal device and a second telecommunication connection can be set up with another terminal device nearest to the calling 25 subscriber. The user group accessing the automatic apparatus can also be limited by identifying the calling subscription and checking that the calling subscriber has an access right to the products and/or services determined by the called subscription.

30 Information about the state of the automatic apparatus can also be transmitted to a service centre by sending a status inquiry message from the service centre to the second terminal device, whereupon the automatic apparatus sends the information to the 35 service centre. The automatic apparatus may inform the service centre e.g. when the automatic apparatus has run out of a product or has a malfunction. Sending

information regarding the state of the automatic apparatus to the service centre allows easier maintenance and filling of the automatic apparatus as it makes it unnecessary to separately inspect each 5 apparatus in its physical location. The transmission of the status data is effected using a data or text message connection.

Furthermore, the system of the invention comprises means for directing the first 10 telecommunication connection to an intelligent network. In addition, the system comprises means for setting up a telecommunication connection with the second terminal device.

The procedure and system of the invention 15 provide a reliable and fast solution for paying for vendor purchases by means of a terminal device in a telecommunication network. An advantage for the user is that he/she is able to operate the automatic apparatus by means of his/her mobile telephone and 20 activate the automatic apparatus to perform predetermined operations relating to the service, e.g. by simply calling an optional service number. Thus, the mobile station functions as a kind of remote controller of the automatic apparatus. This means that 25 the user does not need to have any cash with him/her because the charges for the selected automated services are included in the telephone bill for the mobile subscription in question.

In the following, the invention will be 30 described in detail by referring to the attached drawings, wherein Fig. 1 presents a system according to the invention.

The system presented in Fig. 1 comprises a first terminal device 1, a control centre 2 provided 35 with means for handling short messages and/or data calls, an automatic apparatus 3 comprising a second terminal device 4 and a control unit 5 connected to

it, a telecommunication network 6 comprising an intelligent network 7, said intelligent network containing means 8 for determining charge and location data and producing voice messages, a first 5 telecommunication connection 9 and a second telecommunication connection 10.

In a preferred embodiment of the procedure and system of the invention, the calling subscriber communicates via a first terminal device 1 with a 10 second terminal device 4 over the telecommunication network 6. In Fig. 1, the first terminal device 1 in the telecommunication network 6 is a mobile station and the second terminal device 4 in the telecommunication network is also a mobile station. To 15 use the payment system of the invention, the calling subscriber dials on his/her mobile station 1 a specially priced service number, e.g. a number beginning with the digits 0700. The call is directed via the mobile communication network 6 to the 20 intelligent network 7. After this, a number conversion is carried out by performing certain known actions, whereupon the call is directed to the mobile station 4 comprised in the automatic apparatus 3. In other words, the call is connected to a so-called C-number. 25 It is to be noted that, if desirable, a connection with the mobile station 4 in the automatic apparatus 3 can be set up via several different numbers. Differently priced service numbers are thus used to implement billing for differently priced products.

30 Further, a billing ticket is generated on the basis of the call, the subscription to be charged being the calling subscription. In a preferred case, an intelligent network exchange comprised in the intelligent network 7 takes care of the charging for 35 the call and directing the call to the mobile station 4 in the automatic apparatus 3. This kind of operations based on number conversions in an

intelligent network are known to the person skilled in the art and are therefore not described in detail in this context. A more detailed presentation of intelligent networks can be found e.g. in ITU-T 5 recommendations Q.121X or in Bellcore AIN recommendations.

In the invention, the essential point is the operation of the mobile station 4 placed in the automatic apparatus 3 and especially the control unit 10 5 comprised in the automatic apparatus. In a preferred case, the control unit 5 communicates with both the automatic apparatus 3 and the mobile station 4 in the automatic apparatus 3 and controls their operation. The communication between the control unit 5 and the 15 automatic apparatus 3 can be advantageously implemented in the following ways:

- emulation of a coin-operated lock, i.e. the control unit simulates a coin-operated lock by giving the automatic apparatus signals corresponding to a 20 coin-operated lock e.g. via a relay switch or equivalent;

- card reader emulation dialogue with the central processing unit of the automatic apparatus; and/or  
- user emulation, i.e. pressing option buttons 25 provided in the automatic apparatus and reading the switches to obtain relevant information e.g. when the automatic apparatus runs out of a product.

The communication between the control unit 5 and the mobile station 4 in the automatic apparatus 3 30 is preferably implemented using a series protocol. In a preferred embodiment of the present invention, the telephone in the automatic apparatus is a Siemens M1, which uses the expanded AT command language. However, many other alternatives regarding the terminal device 35 and the command language are possible. The communication usually comprises e.g. the following actions:

- answering the call or leaving it unanswered, which can be done either using a voice prompt, in which case the telephone is connected to an answering machine, or using a signal tone, in which case it is 5 possible to utilise the modem answer-back tone obtained in data and telefax connections;
- information regarding connection of the call e.g. to ensure correct billing;
- disconnection of the call upon the lapse of a 10 certain length of time;
- optional calling subscriber identification;
- pretending to be busy; and/or
- quitting the network.

Thus, the control unit 5 monitors and controls 15 the mobile station 4 and the automatic apparatus 3. If desirable, the control unit 5 only answers a call if the automatic apparatus 3 is able to carry out the actions selected. The mobile station 4 may also pretend to be busy, quit the network altogether 20 (switching off of power to the mobile station) and/or report an error situation. After carrying out the function, the control unit 5 releases the call to free the line. The control unit 5 in the automatic apparatus 3 is e.g. a computer, microcontroller or a 25 similar electronics unit, which matches the mobile station 4 with the automatic apparatus 3 and activates the automatic apparatus 3 so that it will perform the predetermined actions comprised in the service. The control unit 5 preferably transmits control data to 30 the automatic apparatus 3 on the basis of the number dialled by the calling subscriber and carries out the operations mentioned.

The automatic apparatus 3 is e.g. a jukebox or 35 an apparatus for selling drinks and/or tickets. The automatic apparatus 3 may be even a device controlling a barrier at the gate of a parking area. In principle, this may be any automatic apparatus providing

commodities, such as articles and services. E.g. in the case of a jukebox, when a customer makes a call from his/her terminal device 1 to the number corresponding to the automated service, the control 5 unit 5 activates the jukebox so as to make it play the music selected by the customer. Thus, the customer need not insert any money into the automatic apparatus 3, but instead the bill for the automated service is included in the telephone bill for the calling 10 subscription concerned.

It is also possible to include an IVR (Interactive Voice Response) functionality in the payment system of the invention, in which case the IVR system may ask the user which product he/she wants. 15 The user gives the answer in the form of DTMF (Dual Tone MultiFrequency) tone signals via his/her mobile station 1, whereupon the call is directed to the terminal device 4 in the automatic apparatus 3 and the metering pulses are transmitted to the intelligent 20 network system 7. IVR can be used to give the prompts if this function is missing in the automatic apparatus 3.

In an embodiment of the payment system of the invention, a connection with the automatic apparatus 3 can be set up e.g. by calling the mobile station 4 in the automatic apparatus 3 via several different service numbers to order different / differently 25 priced products. The payment system can utilise e.g. the voice, data and fax numbers of a GSM (Global 30 System for Mobile Communications) telephone, permitting several calls to be logically connected to the telephone in the automatic apparatus one at time. In the control unit, the incoming data numbers and fax 35 numbers are interpreted on the basis of their type (fax, data 9600, data 4800, and so on) as differently priced calls. The actual tasks of determining the price and directing the calls to the numbers in

question are performed in the intelligent network 7. Alternatively, it is possible to make use of the calling subscriber number identification feature of the GSM telephone so that different numbers are 5 directed in the intelligent network system 7 or IVR via a physically or logically different line, i.e. calling subscriber number, to the automatic apparatus, thus enabling the automatic apparatus to determine the call price on the basis of the calling subscriber 10 number.

As for other embodiments of the invention, let it be stated that instead of a mobile station 4 the automatic apparatus 3 can also be provided with an optional special device designed for wireless data 15 transmission, such as a wireless modem. If necessary, the service can also be allowed e.g. for wired-network telephones. In any case, the basic idea of the invention is that the mobile station 1 is for the customer a personal payment terminal which is used in 20 front of the automatic apparatus 3 as a kind of remote control device.

Moreover, in the payment system of the invention it is possible to make effective use of many additional features of the telecommunication network 25 6, such as area control and/or location data, in which case a given telephone number only works in a certain part of the country in the vicinity of the automatic apparatus 3. This makes it possible to eliminate unnecessary calls to a wrong number. Area control also 30 permits use of the same number e.g. in two or more areas.

If necessary, specific user groups can be defined. This is a useful function e.g. in an application for opening a garage door. In this case, 35 the automatic apparatus 3 checks the calling number e.g. against a special service-specific list of allowed callers.

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined by the claims.

## CLAIMS

1. Procedure for providing a service in a telecommunication system comprising a first terminal device (1), a control centre (2) comprising means for handling short messages and/or data calls, an automatic apparatus (3) comprising a second terminal device (4) and a control unit (5) connected to it, a telecommunication network (6) comprising an intelligent network (7), said intelligent network containing means (8) for determining charge and location data and producing voice messages, a first telecommunication connection (9) and a second telecommunication connection (10), in which procedure the first terminal device (1) and the second terminal device (4) as well as the control centre (2) are connected to the telecommunication network (6), and in which procedure a calling subscriber orders a product from the automatic service apparatus (3) by means of the first terminal device (1) by setting up a first telecommunication connection (9) with a called subscriber number, characterised in that the first telecommunication connection is directed to the intelligent network (7), where  
charge data is determined;  
25 a second telecommunication connection (10) with the second terminal device (4) is set up; and  
by means of the control unit (5), the automatic apparatus (3) is controlled on the basis of the second telecommunication connection (10) and the state of the automatic apparatus (3).  
2. Procedure as defined in claim 1, characterised in that, if the automatic apparatus has run out of the product ordered and/or the service is busy, then  
35 the control unit (5) sets the second terminal device into a "busy" or "no answer" state; and

the user of the first terminal device (1) is informed about the state of the automatic service apparatus (3) by means of a voice message sent over the first telecommunication connection (9).

5 3. Procedure as defined in claim 1 or 2, characterised in that, if the automatic service apparatus (3) has run out of all products and/or services, then

the control unit shuts (5) off the second terminal  
10 device (4); and

the user of the first terminal device (1) is informed about the state of the automatic service apparatus (3) by means of a voice message sent over the first telecommunication connection (9).

15 4. Procedure as defined in claims 1 - 3, characterised in that, if there is a malfunction in the automatic service apparatus, then

the control unit (5) sets the second terminal device (4) into a "busy" or "no answer" state; and

20 the user of the first terminal device (1) is informed about the state of the automatic service apparatus (3) by means of a voice message sent over the first telecommunication connection (9).

5. Procedure as defined in any one of claims 1  
25 - 4, characterised in that

the location of the calling subscriber is determined on the basis of the location data of the first terminal device (1); and

30 a second telecommunication connection (10) with another terminal device (4) located nearest to the calling subscriber is set up.

35 6. Procedure as defined in any one of claims 1 - 5, characterised in that the calling subscription is identified and the calling subscriber's access right to the products and/or services determined by the called subscription is verified.

7. Procedure as defined in any one of claims 1 - 6, characterised in that information about the state of the automatic apparatus (3) is transmitted to the control centre (2) if

5 a status inquiry message is sent from the control centre (2) to the second terminal device (4);

the automatic service apparatus has run out of a product, and/or

the automatic service apparatus has a malfunction.

10 8. Procedure as defined in any one of claims 1 - 7, characterised in that information regarding the state of the automatic apparatus (3) is sent to the service centre over a data or text message connection.

15 9. System for implementing a service in a telecommunication system comprising a first terminal device (1), a control centre (2) comprising means for handling short messages and/or data calls, an automatic apparatus (3) comprising a second terminal device (4) and a control unit (5) connected to it, a telecommunication network (6) comprising an intelligent network (7), said intelligent network containing means (8) for determining charge and location data and producing voice messages, a first telecommunication connection (9) and a second telecommunication connection (10), in which system the first terminal device (1) and the second terminal device (4) as well as the control centre (2) are connected to the telecommunication network (6),

20 30 characterised in that

the system comprises means for directing the first telecommunication connection (9) to the intelligent network (7);

35 the intelligent network (7) comprises means for determining charge data;

the system comprises means for setting up a second telecommunication connection (10) with the second terminal device (4).

5 the control unit (5) comprises means for controlling and monitoring the functions of the automatic service apparatus (3) and for monitoring the second telecommunication connection (10).

10 10. System as defined in claim 9, characterised in that the control unit (5) comprises means for setting the second terminal device (4) to a "busy" or "no answer" state.

15 11. System as defined in claims 9 and 10, characterised in that the control unit (5) comprises means for shutting off the second terminal device (4).

20 12. System as defined in any one of claims 9 - 11, characterised in that the system comprises means for delivering a voice message about the state of the automatic service apparatus (3).

13. System as defined in any one of claims 9 - 12, characterised in that the system comprises means for determining location data for the calling subscriber.

25 14. System as defined in any one of claims 9 - 13, characterised in that the system comprises means for setting up a second telecommunication connection (10) with an automatic apparatus (3) nearest to the calling subscriber.

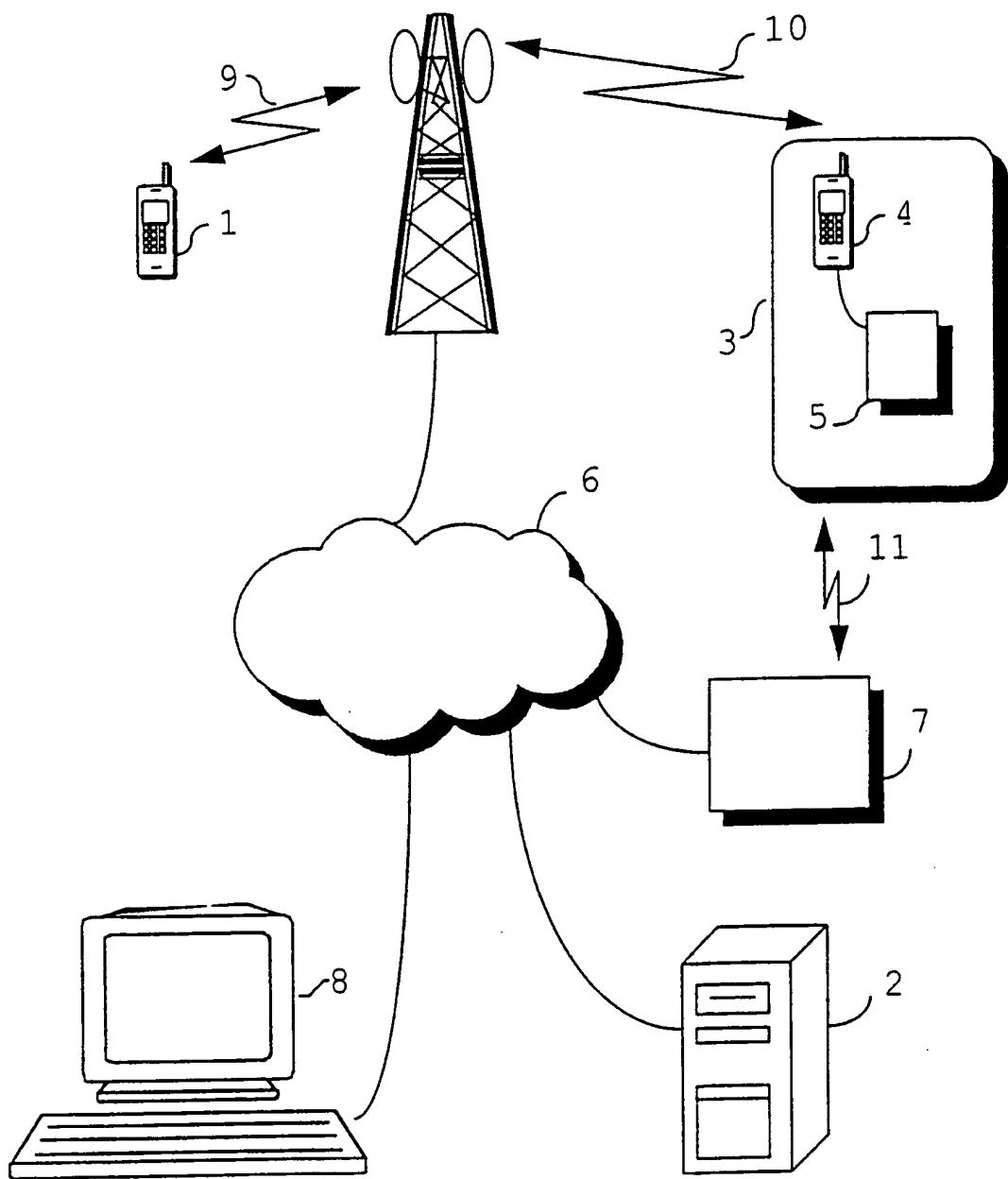
30 15. System as defined in any one of claims 9 - 14, characterised in that the second terminal device (4) comprises means for transmitting and receiving short messages and/or data calls.

35 16. System as defined in any one of claims 9 - 15, characterised in that the control unit (5) is a computer and/or microcontroller.

17. System as defined in any one of claims 9 - 16, characterised in that the first terminal device (1) is a mobile station.

18. System as defined in any one of claims 9 - 5 17, characterised in that the first terminal device (1) is a tone frequency telephone apparatus.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 98/00843

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G07F 7/00, H04M 11/00 // H04M 3/42

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

IPC6: G07F, H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

JAPIO, EDOC, WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, abstract of JP 8-249530 A (SANYO ELECTRIC CO LTD), 27 Sept 1996 (27.09.96) --	1-18
X	Patent Abstracts of Japan, abstract of JP 10-149400 A (HITACHI LTD), 2 June 1998 (02.06.98) --	1-18
P,X	Ny Teknik, Volume 98/36, 1998, J. Mellin, "Betala läsken på telefonräkningen" page 11 --	1-18
A	Patent Abstracts of Japan, abstract of JP 8-227478 A (HIROSE FUMITADA), 3 Sept 1996 (03.09.96) --	

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PCT/FI 98/00843

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Patent Abstracts of Japan, abstract of JP 4-15785 A (FUJI ELECTRIC CO LTD), 21 January 1992 (21.01.92) -- -----	